



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,910	11/12/2003	Satoshi Umemura	5095-4076	9487
27123	7590	08/12/2004	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			ALI, MOHAMMAD M	
			ART UNIT	PAPER NUMBER
			3744	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,910

Applicant(s)

UMEMURA ET AL.

Examiner

Mohammad Ali

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/12/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., (6,062,824) in view of Asai (4,875,658). Kimura et al., disclose a control valve 49 of a variable displacement compressor comprising a crank chamber 15 for adjusting a pressure in the crank chamber 15 by varying an opening degree of passage that interconnects the crank chamber 15 and one of relatively high and low pressures regions of the refrigeration cycle, the control valve 49 comprising a valve seat 74a having a seat surface for adjusting the opening of the passage; and a valve 74 having a valve surface for adjusting the opening degree of the passage. Kimura et al., disclose the invention substantially as claimed as stated above. See Fig.1 and 2. However, Kimura et al., do not disclose a seat or valve surface made of a material relatively high hardness. Asai teaches the uses of improved wear resistance material by

surface treating to harden the surface of valve body and valve needle in an electromagnetic control valve for the purpose of having relatively harder valve and valve body/seat surface. See Column 2, lines 9-15. Asai also discloses a surface treatment process of ion nitrating for claim 4. See column 5, lines 26-31. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai such that relatively high hardness material for valve or seat surface and ion nitriding surface hardening process could be provided in order to have a hardened seat/valve surface.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., in view of Asai as applied to claim 1 above and further in view of Lee, II et al.

Kimura et al., in view of Asai disclose the invention substantially as claimed as stated above. However Kimura et al. in view of Asai do not disclose different material for valve surface and seat surface. Lee,II et al., teach the use of valve surface and seat surface made of different material in a flow control valve for the purpose of having different hardness for the valve and the seat. See abstract. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai and further in view of Lee, II et al., such that different material for valve and seat could be provided in order to have a different hardness to seat and valve surface.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., in view of Asai as applied to claim 1 above and further in view of Pitla et al., (US2003011589A1) Kimura et al., in view of Asai disclose the invention substantially as

claimed as stated above. However Kimura et al. in view of Asai do not disclose an oil separator. Pitla et al., teach the use of an oil separator 202 connected to a discharge chamber 174/high pressure region in a control valve 200 of a variable displacement compressor for the purpose of separating oil coming with a high-pressure gas. See Fig. 2a or 2b. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai and further in view of Pitla et al., such that an oil separator could be provided in order to separate oil from the high pressure gas.

4. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., in view of Asai as applied to claim 1 above and further in view of Yamanaka et al., (6,321,564). Kimura et al., in view of Asai disclose the invention substantially as claimed as stated above. However Kimura et al. in view of Asai do not disclose carbon dioxide as refrigerant a pressure difference of 10 MPa. Yamanaka et al., teach the use of carbon dioxide as refrigerant 10 Mpa pressure difference between the low side and high side pressure region in a refrigerant cycle system for the purpose of having a desired refrigerant system avoiding Chlorine based refrigerant in the system to save the environment. See column 4, lines 21-24 and lines 56-57. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai and further in view of Yamanaka et al., such that carbon dioxide refrigerant and system for 10 Mpa pressure difference could be provided in order to have a desired refrigeration circuit.

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., in view of Asai as applied to claim 1 above and further in view of Takahashi et al., (6,082,317) Kimura et al., in view of Asai disclose the invention substantially as claimed as stated above. However, Kimura et al. in view Asai do not disclose Vickers hardness 500 or above. Takahashi et al., teach the use of Vickers hardness in the range of 500 to 1800 in a valve seat for the purpose of having a desired hardness of the valve seat. See column 1, lines 52-60. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai and further in view of Takahashi et al., such that a Vickers hardness in the range of 500 and above could be provided in order to have a desired hardness to valve seat.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al., in view of Asai and Takahashi et al. as applied to claim 7 above and further in view of Horimoto et al., (JP02000130607A) Kimura et al., in view of Asai and Takahashi et al., disclose the invention substantially as claimed as stated above. However, Kimura et al. in view Asai and Takahashi et al. do not disclose Vickers hardness of 900 or above with valve surface. Horimoto et al., teach the use of Vickers hardness in the range of 900 with the valve surface 64 in a valve body for the purpose of having a desired hardness of the valve surface. See the abstract. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control valve of Kimura et al., in view of Asai, Takahashi et al., and

Art Unit: 3744

further in view of Horimoto et al., such that a Vickers hardness in the range of 900 could be provided in order to have a desired hardness to valve surface.

Any inquiry concerning this communication or earlier from the examiner should be directed to Mohammad M. Ali, whose telephone number is (703) 308-5032. The examiner can be reached from 6:10am to 4:30pm from Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel, can be reached at (703) 308-2597. The fax number for the organization where this application or proceeding is assigned is 703-308-7764 for regular communications and after-final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.


Mohammad M. Ali

August 10, 2004